Remarks

This Application has been carefully reviewed in light of the Office Action dated mailed March 26, 2004. Claims 1-59 were pending at the time of the Office Action. Claims 2-5, 9-13, 18-20, 22-24, 37-39, and 49-59 were rejected. Claims 6-8, 14-17, 21, 25, and 40 are objected to. Claims 1, 26-36, and 41-48 are allowed. Although Applicants believe all pending claims are allowable without amendment, to expedite issuance of a patent from this Application, independent Claims 2, 18, 22 and 37 have been amended to more clearly claim the subject matter. Independent Claim 49 has been amended to substantially include the limitations of Claim 50, and Claim 50 has been cancelled. Applicants respectfully request reconsideration and allowance of all pending Claims 1-49 and 51-59.

Section 112 Rejection

Claim 50 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The limitations of Claim 50 have been substantially incorporated into Claim 49, and such limitations have been amended in to more clearly claim the subject matter which Applicants regard as the invention.

Claims 2-5, 9-13, 18-20, 22-24 and 37-39 are Allowable

Claims 2-5, 9-13, 18-20, 22-24, and 37-39 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,933,620 to MacMinn et al. (hereinafter, "*MacMinn*").

Claim 2, as amended, recites:

> A method of reducing noise and vibration in a switched reluctance motor drive comprising:
> generating, by a computer, a phase current profile by:
> initializing one or more first profile parameters defining at least a first portion of the phase current profile;
> determining whether a first performance criterion is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined at least by the one or more first profile parameters; and
> updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied;
> generating a phase current according to the phase current profile; and
> applying the phase current to the switched reluctance motor drive.

Applicants respectfully submit that *MacMinn* fails to disclose, teach, or suggest at least these limitations. For example, *MacMinn* fails to disclose, teach, or suggest "determining whether a first performance criterion is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined at least by the one or more first profile parameters; and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied," as specifically recited in amended Claim 2.

MacMinn discloses a control system for a switched reluctance motor (SRM) that includes a regulator that controls the firing angles of current pulses to the SRM so that over a wide range of rotor speeds and levels of source voltages, the winding current reaches a particular set point at a particular angle. (col. 2, lines 49-60). The regulator compares a signal proportional to the phase current in the motor with a phase current reference. When the phase current first reaches the level of the reference, a state change is detected and utilized to retain the rotor angular position at the instant that the phase current reached the reference value. The information is then used in a feedback control system to adjust the turn-on and turn-off angles to assure that current reaches the commanded value at the commanded angle. (col. 2, line 65 - col. 3, line 7).

Thus, *MacMinn* discloses a feedback control system that adjusts the turn-on and turn-off firing angles of current pulses to an SRM to assure that current reaches a commanded value at a commanded angle, regardless of speed, voltage or torque. (Col. 3, lines 41-44). For example, FIG. 2B of *MacMinn* illustrates a current profile 28 used for a first, relatively slow rotor speed, which produces the desired inductance profile shown by the portion of FIG. 2A above current profile 28. (Col. 5, lines 3-40). The current profile 28 used at the relatively slow rotor speed includes a current turn-on angle θ_o, a current turn-off angle θ_p, and a zero-current angle, θ_p. (Col. 5, lines 23-40; FIG. 2B). The current turn-on angle θ_o and current turn-off angle θ_p are separated by a particular pulse width angle, θ_{pw}. (Col. 5, lines 37-40; FIG. 2B). As the rotor speed increases to a second, relatively fast rotor speed, the control system controls current turn-on angle θ_o and current turn-off angle θ_p in order to (a) assure that current reaches a commanded value at a commanded angle, and (b) optimize torque production. (Col. 5, lines 41-47; Col 3, lines 41-44; FIG. 2B).

Thus, as discussed above, *MacMinn* discloses a feedback control system that automatically adjusts the turn-on and turn-off firing angles, θ_o and θ_p, of current pulses to an SRM to assure that current reaches a commanded value at a commanded angle, regardless of speed, voltage or torque. This cannot be equated with "determining whether a first performance criterion is satisfied based on operation of the switched reluctance motor drive using the phase current profile defined at least by the one or more first profile parameters; and updating at least one of the one or more first profile parameters if the first performance criterion is not satisfied," as specifically recited in amended Claim 2. Indeed, nowhere does *MacMinn* disclose determining whether a performance criterion is satisfied based on the operation of an SRM drive using a particular phase current profile, much less updating one or more parameters of that phase current profile if the performance criterion is not satisfied.

For at least these reasons, *MacMinn* fails to disclose, teach, or suggest each and every limitation of amended Claim 2. Thus, Applicants respectfully request reconsideration and allowance of amended Claim 2, together with all claims that depend therefrom. In addition, for at least the reasons stated with regard to Claim 2, Applicants respectfully request reconsideration and allowance of amended independent Claims 18, 22 and 37, together with all claims that depend therefrom.

Claims 49-59 are Allowable

Claim 49 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,442,535 to Yifan (hereinafter, "*Yifan*").

Claim 49, as amended, recites a switched reluctance motor system comprising:

> a switched reluctance motor;
> a neural network comprising a plurality of neurons connected by a network, each neuron having an associated weight, wherein the neural network is operable to receive one or more inputs and to output a desired phase current profile based on the inputs and the weights, the desired phase current profile comprising:
> a current turn-off instant defining a desired instant at which the phase current is turned off; and
> a current turn-off profile defining a desired decay of the magnitude of the phase current from the magnitude of the phase current at the current turn-off instant to zero, wherein the desired decay is less rapid than a natural decay of the phase current; and
> a phase current applied to the switched reluctance motor according to a phase current profile output by the neural network.

Applicants respectfully submit that *Yifan* fails to disclose, teach, or suggest at least these limitations. For example, *Yifan* fails to disclose, teach, or suggest a "neural network . . . operable to receive one or more inputs and to output a desired phase current profile based on the inputs and the weights, the desired phase current profile comprising: a current turn-off instant defining a desired instant at which the phase current is turned off; and a current turn-off profile defining a desired decay of the magnitude of the phase current from the magnitude of the phase current at the current turn-off instant to zero, wherein the desired decay is less rapid than a natural decay of the phase current," as specifically recited in amended Claim 49.

For at least these reasons, *Yifan* fails to disclose, teach, or suggest each and every limitation of amended Claim 49. Thus, Applicants respectfully request reconsideration and allowance of amended Claim 49, together with all claims that depend therefrom.

Conclusion

Applicants have made an earnest attempt to place this case in condition for allowance. For at least the foregoing reasons, Applicants respectfully request full allowance of all the pending claims.

If the Examiner feels that a telephone conference or an interview would advance prosecution of this Application in any manner, please feel free to contact the undersigned attorney for Applicants.

Enclosed is a check for $110.00 to cover the one (1) month Extension of Time fee. Although no other fees are believed to be due, the Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 02-0384 of Baker Botts, L.L.P.

Respectfully submitted,

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